IN THE FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:	)	
	)	
Amendment of the Commission's Rules	)	ET Docket No. 96-102
to Provide for Operation of Unlicensed NII	)	
Devices in the 5 GHz Frequency Range	)	
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To: The Commission

PETITION FOR RULEMAKING

Pursuant to Section 1.401 of the Commission's Rules, Clarity Wireless Incorporated (Clarity Wireless) submits this Petition for Rulemaking to delete the third sentence of Section 15.407(a)(3) and substitute five new sentences as follows:

Original Wording: If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Proposed Wording: Except for systems used exclusively for fixed point-to-point operations, if transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Systems used exclusively for fixed point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power. Fixed point-to-point operation excludes the use of point-to-multipoint systems, omnidirectional applications and multiple co-located intentional radiators transmitting the same information. The operator of the intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively

for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of the responsibility. (For similar language as applied to Part 15 spread spectrum devices, *See* 47 C.F.R. § 15.247(b)(3)(ii)-(iii)).

Introduction

Pursuant to Part 15, operation in the 5.725-5.825 GHz band is authorized for U-NII (Unlicensed-National Information Infrastructure) devices as defined in Subpart E of Part 15 and also for spread spectrum devices satisfying the requirements of Section 15.247. This band is also shared with amateur radio services and government radiolocation services.

Rules for the operation of U-NII devices were adopted to make unlicensed broadband high data rate services available to the public. *Report and Order*, E.T. Docket No. 96-102 (January 9, 1997) at ¶ 27. It was believed that these services would help meet the demands of multimedia networks desired by educational, medical, industrial, and consumer users. Another expected result of the new rules was to be a fostering of the development of new industries. *Report and Order* of January 9, 1997 at ¶ 1.

The Commission has set radiated power limits independently for the U-NII devices and for the spread spectrum devices. For U-NII devices operating in the 5.725-5.825 GHz band, peak transmit power may not exceed 1 W and peak power spectral density may not exceed 50 mW/MHz. 47 C.F.R. § 15.407 (a) (3). Furthermore, if transmitting antennas of direction gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density must be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. *Id.* Part 15 spread spectrum devices operating in the same band are also limited to 1 W peak transmit power. 47 C.F.R. § 15.247(b)(3)(ii). The spread spectrum devices, however, may use transmitting antennas with direction gain greater than 6 dBi without reduction of maximum radiated power, provided that they operate as a part of fixed point-to-point systems. The difference in the treatment of directional antennas arose when the FCC amended Section 15.247 in the *Report and Order*, E.T. Docket No. 96-8 (April 10, 1997). Prior to this *Report and Order* in E.T. Docket No. 96-8, all devices governed

by Section 15.247 were also restricted from using transmitting antennas of direction gain greater than 6 dBi without accompanying reduction of maximum transmit power.

Because U-NII systems serve important public purposes, the restriction on their use of directional antennas should be relaxed in the same way that this restriction has been relaxed for Section 15.247 devices. Under the current rules, U-NII links are now potentially subject to interference from Section 15.247 devices operating at maximum power with high directional gain. In many situations, the radiated power and directivity now permitted to U-NII devices will be insufficient to overcome the deleterious effects of this interference. This greatly undermines the effectiveness of U-NII systems and hinders their ability to provide the wireless high data rate services needed by the public. Removing the directivity restriction as petitioner requests will further all of the goals envisioned when the 5.725-5.825 GHz band was made available for U-NII devices

Furthermore, removing the restrictions on the directivity of U-NII radiators should not cause harmful interference to the amateur radio and radiolocation services that share the 5.725 - 5.825 GHz band. Any additional interference caused by directional U-NII radiators would be similar in magnitude to the interference already caused by Section 15.247 devices that take advantage of transmitting antennas with direction gain greater than 6 dBi. Finally, our requested rewording leaves in place the restrictions on harmful interference of 47 C.F.R. § 15.5(b)-(c).

I. The Current Limits on Antenna Directivity Undermine the Intended Effectiveness of U-NII Systems.

The FCC established the U-NII service in its *Report and Order* of January 9, 1997 in E.T. Docket No. 96-8. The FCC recognized the need for unlicensed spectrum to facilitate wireless transfer of large volumes of data by multimedia and other applications, and the potential for vast benefit to educational, medical, business, industrial, and consumer users. *Report and Order* of January 9, 1997 at ¶ 7-19. Furthermore, the FCC decided against making specific requirements as to channeling and modulation scheme, recognizing the advantages of maintaining maximum flexibility at the current early stage of technological development of U-NII devices. *Report and Order* of January 9, 1997 at ¶ 61. In setting power and directivity limits for U-NII devices operating in the 5.725-5.825 GHz band,

the FCC envisioned successful operation of community networks with a typical range of several kilometers and even longer-range communication in low interference environments. *Report and Order* of January 9, 1997 at ¶ 46.

The current regulatory regime for the 5.725-5.825 GHz band, under which Part 15 spread spectrum devices are permitted unlimited transmitter antenna directivity but U-NII devices remain restricted, hinders achievement of the goals for which the U-NII service was established. U-NII systems will now potentially operate in the presence of interference caused by more directive spread spectrum transmitters with high effective radiated power. Because the U-NII transmitters still have their directivity restricted, their effective radiated power will be insufficient in many situations to overcome the interference caused by Part 15 spread spectrum devices. The intended beneficiaries of U-NII services will suffer interruptions in their ability to communicate or even a complete inability to enjoy the benefits intended for them.

The current rules are biased toward spread spectrum operation in the 5.725-5.825 GHz band and thus discourage development of modulation schemes other than spread spectrum. Petitioner Clarity Wireless is currently developing a high data rate communication system based on improvements to OFDM (Orthogonal Frequency Division Multiplexing) techniques. The system being developed will offer significant advantages over spread spectrum techniques in immunity to multipath effects and operation in the presence of noise. Clarity Wireless believes that this new system is ideal for the applications envisioned by the FCC when the U-NII service was initiated. Yet under the current rules, Clarity Wireless' system would operate under a handicap as compared to Part 15 spread spectrum systems – a handicap that may prevent or delay the development and deployment of a superior OFDM-based system.

The difference in antenna directivity limits between the U-NII and spread spectrum rules harms U-NII applications in a way that petitioner does not believe was intended by the FCC.

II. Lifting Directivity Restrictions on U-NII Devices Would Restore the Intended Effectiveness of U-NII Systems Without Causing Undue Harm to Other Services.

Although several commenters in ET Docket No. 97-5 recommended permitting high gain transmitting antennas in combination with 1 W transmitter power, the FCC decided against permitting high gain antennas because of the potential for interference with the primary service sharing the band, Government radiolocation.

At the time of the Report and Order, the FCC was considering allowing higher gain for Part 15 Spread Spectrum Devices in ET Docket No. 96-8. The FCC suggested in its *Report and Order* of January 9, 1997 in E.T. Docket No. 96-102 that if directivity limits were raised for the spread spectrum devices, it might then be appropriate to also reconsider removing the directivity limits on the U-NII devices. *Report and Order* of January 9, 1997 at ¶ 47. In its *Report and Order* of April 10, 1997 in E.T. Docket No. 96-8, the FCC did in fact remove directivity limits on Part 15 spread spectrum devices in the 5.725-5.825 GHz band. It is now appropriate to revisit the directivity limits on U-NII devices.

In removing the directivity limits for spread spectrum devices, the FCC has already weighed the potential threat of interference to radiolocation services and deemed it to low because of the propagation characteristics of the band and the scarcity of mobile units in the band. *Report and Order* of April 10, 1997 at ¶ 17. The interference caused by highly directive U-NII devices would be no greater. Furthermore, the new rules requested by Clarity Wireless would require that high directivity U-NII transmitters, like high directivity spread spectrum transmitters, be used exclusively for fixed, point-to-point operations, thereby reducing the interference potential.

Petitioner Clarity Wireless would also like to address the comments made by the NTIA in an attachment to its letter of April 18, 1997 responding to the Petitions for Reconsideration filed in ET Docket No. 96-102. In an attachment to this letter entitled "Overview of Apple Computer's Request for Consideration," NTIA recommended that the directional gain for U-NII devices operating in the 5.725 GHz – 5.825 GHz be limited to 23 dBi. In support of this recommendation, NTIA expresses concern that U-NII receivers with high directional gain will be subject to interference from radar transmitters within the main beam of their directional antennas.

NTIA's concern, however, seems to relate to the directivity of the receiver antenna whereas petitioner Clarity Wireless is requesting a change in the rules for transmitter antenna directivity. Clarity Wireless is unaware that receiver antenna directivity is currently regulated in any way. Furthermore, Clarity Wireless recognizes that according to 47 C.F.R. § 15.5(b), operators of all Part 15 systems must accept whatever harmful interference is generated by authorized services including the government radar installations that operate in the 5.725-5.825 GHz band. Clarity Wireless submits that it would therefore be inappropriate to limit transmitter antenna directional gain to 23 dBi on the grounds of potential interference from radar systems to U-NII receivers.

For all the reasons given above, it would now be appropriate to grant Clarity Wireless' request and remove the limits on antenna directivity for point-to-point U-NII links in the 5.725 –5.825 GHz band. Clarity Wireless respectfully requests the Commission to initiate a rulemaking proceeding consistent with the views expressed herein.

Respectfully submitted,

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